Thermaltake Key 3 Spirit

Toughpower QFan

Toughpower *QFan* 500W/650W

(W/Cable Management)

With Built in Extremely Silent 140mm QFan

Patented Design
M314373

www.thermaltake.com

Thermaltake
COOLall YOUR LIFE

Toughpower QFan 500W/650W

~The most silent 140mm QFan in the market~

World's First 140mm QFan Power Supply!!

Thermaltake Technology delivers the most solid line of power supplies, built specifically towards high-end systems for utmost PC system performance. The leader in thermal solutions defines ***Tough*** as being "***able to withstand great strain and stress without tearing or breaking***" same with their newest and latest line of Toughpower power supplies.

QFan 500W/650W Q&A

What is QFan?

The **140mm QFan** features a unique patent designed blade shape and a 360° non-frame, effectively reducing the noise level. The air inlet is designed to increase air flow and reduce the sound of wind shear.

Why use QFan?

The QFan special five way air-intake housing design creates the best heat dissipation environment for the non-frame **140mm QFan** at minimal noise level. Therefore, the fan at low speed setting yield a 17.1 dBA without compromising performance.

How QFan performances?

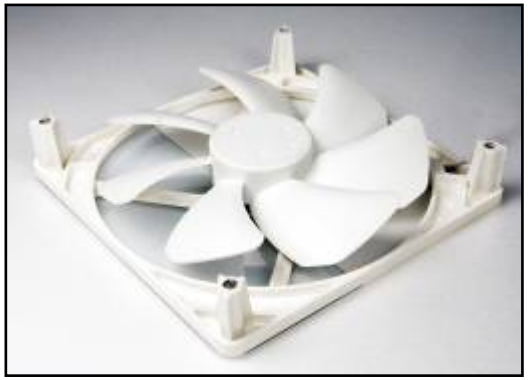
The **140mm QFan** effectively decrease the noise level inside the PSU. The report as below:

	Standard Fan dB(A)	QFan dB(A)
4.75V(20~50% Load)	20.7	17.1
6V(60% Load)	25.6	20.7
12V(100% Load)	40.1	34.1

QFan Main Feature

Toughpower QFan

Non frame 140mm QFan

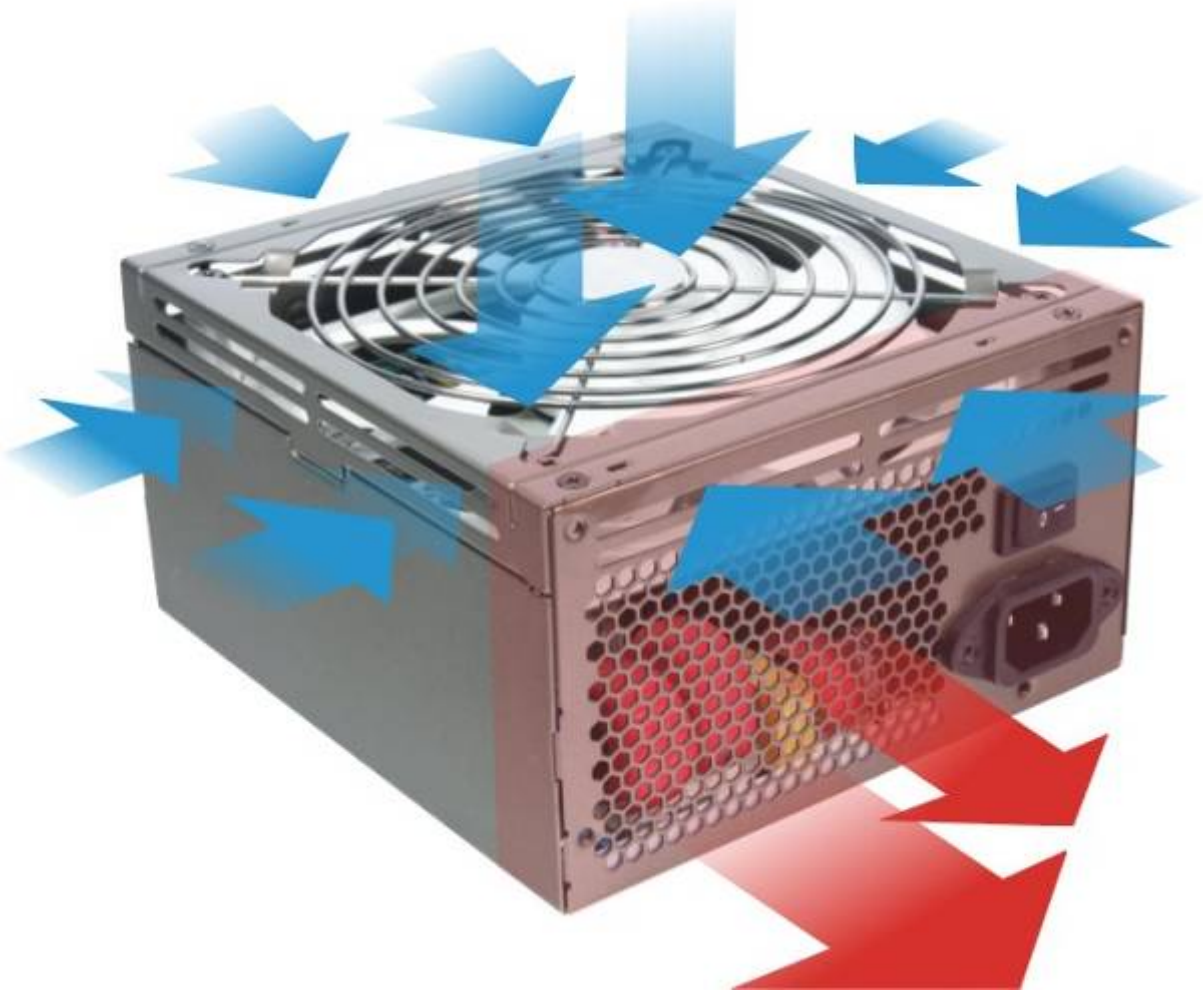


Standard 140mm Fan

Compared with the standard cooling fan, the 140mm QFan has better air flow and lower noise. The reasons as below

- **5-way air intake and 1-way exhaust increases airflow.**
- **No frame design minimise wind shear and reduce the fan noise level.**
- **At the same speed level, QFan only produce 17.1dB (20%~50% loading), decreases 17% noise level.**

QFan Air Flow Direction



Word 1st 5-way air intake housing not only increase air flow but also decrease the noise level. Thus, this unique & patented design yield incredible 17.1 dB noise level.

QFan Main Feature

Non-frame housing

Standard housing

Compare with the standard power housing, QFan series 5-way air intake housing and 1-way air exhaust design increases airflow and keeping noise level significantly lower.

QFan Test Equipment

QFan Acoustic Test Equipment & Test Date

Item	Equipment	Brand	Type	S/N	Last Calibration Date	Due
1	Microphone	G.R.A.S.	Type 40AE	34456	2006/11/20	2007/11/19
2	Preamplifier	G.R.A.S.	Type 26CA	33764	2006/11/20	2007/11/19
3	Microphone calibrator	B&K	4231	2326946	2006/11/20	2007/11/19
5	Analyzer	Head Acoustics	SQLabIII	30881112004	2006/11/23	2007/11/22
7	DC Power Supply	GoodWill	GPS3030DD	N/A	2005/12/7	2007/12/7

QFan Test Method

Test Setup

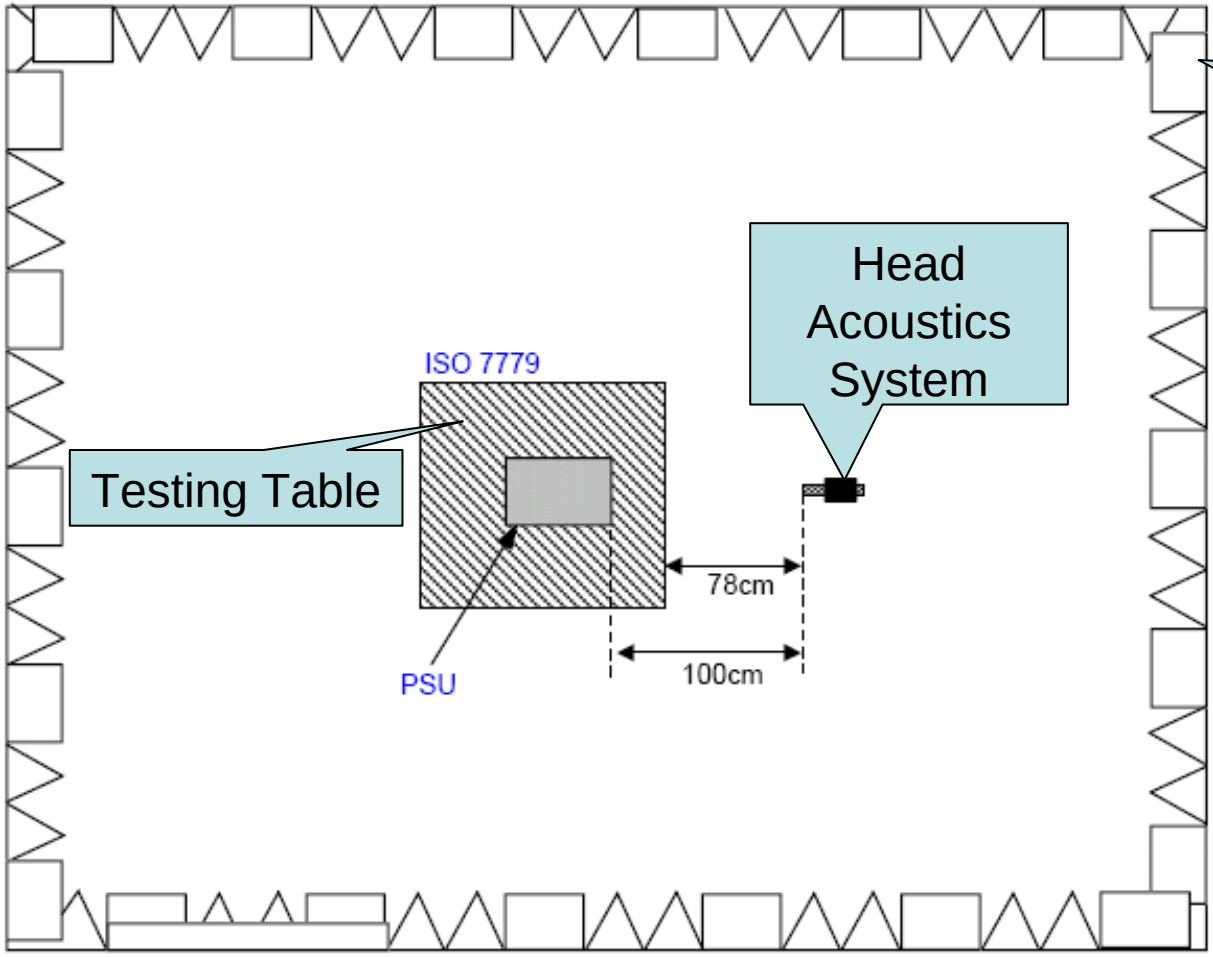


Fig. 1 Topview of setup photo

The QFan power supply was tested at below environment

- Anechoic Chamber
- Cut-off Frequency: < 100 Hz (according to ISO 3744)
- Background Noise: < 16.5 dB(A)
- Instrument: Head Acoustics System (16 channels)

QFan Test Method

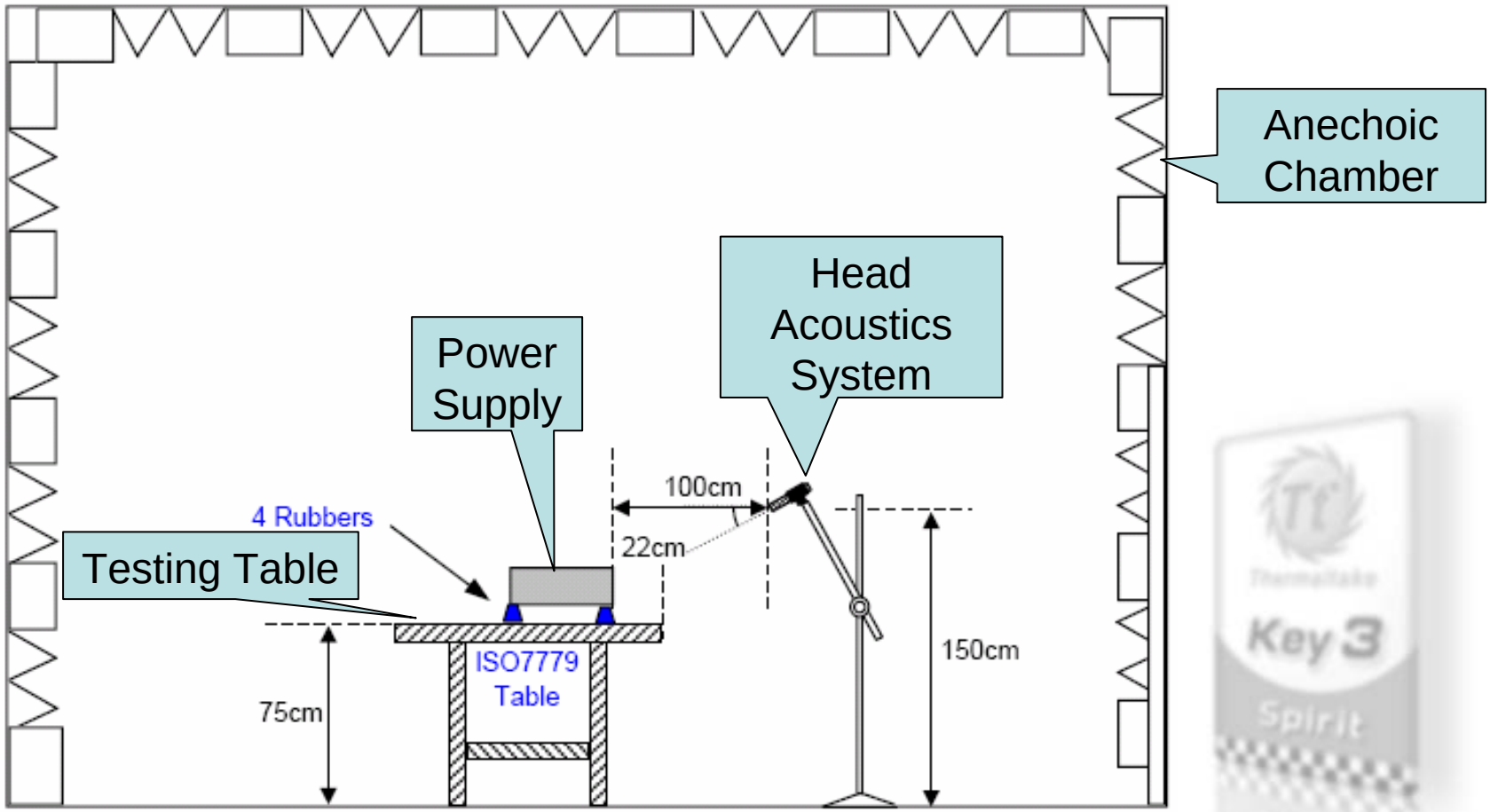


Fig. 2 Sideview of setup photo

QFan Test Method

Setup Photo

Fig. 3 Setup photo

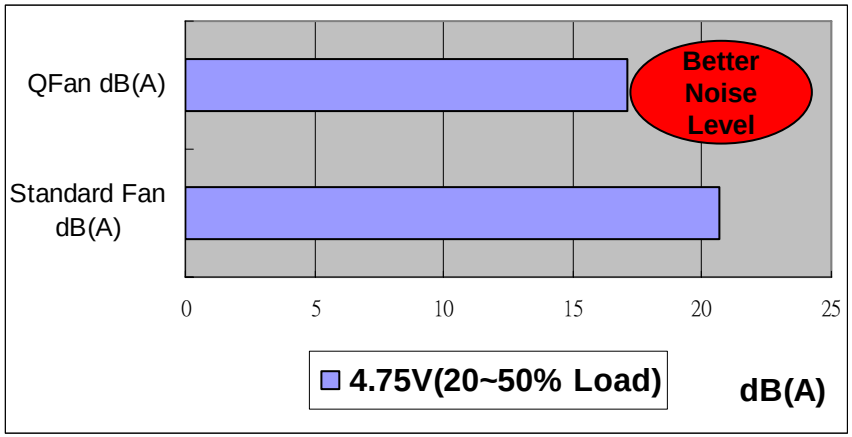
The reality setup photo

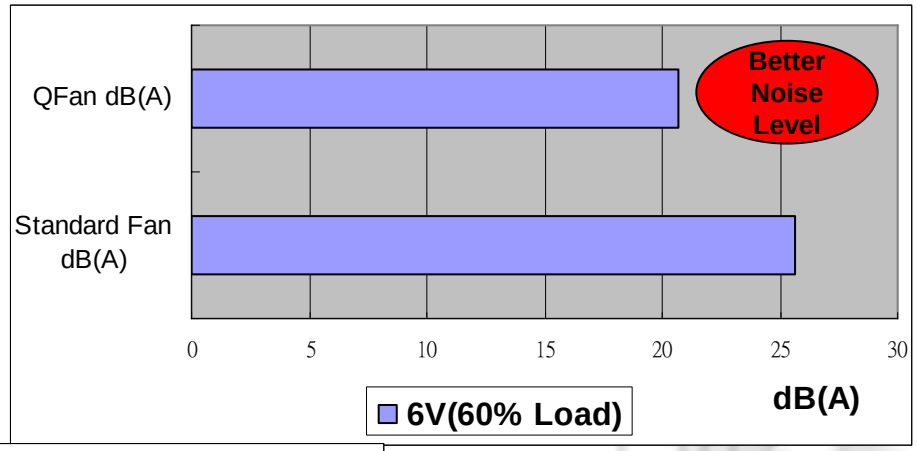
- Anechoic Chamber
- Cut-off Frequency: < 100 Hz (according to ISO 3744)
- Background Noise: < 16.5 dB(A)
- Instrument: Head Acoustics System (16 channels)

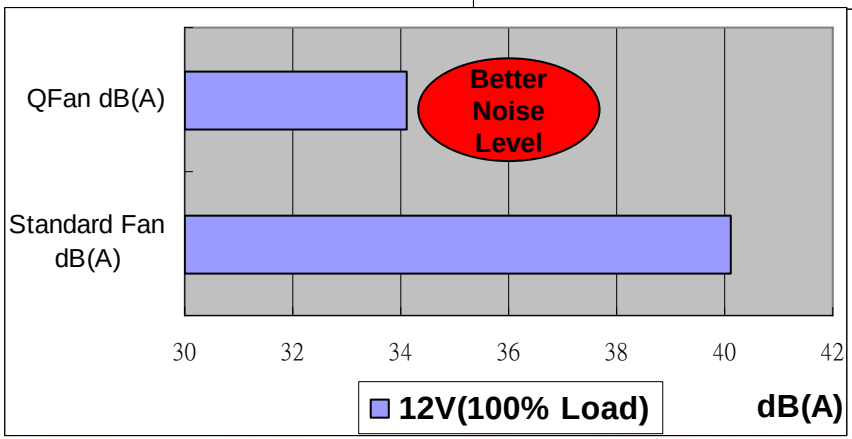
QFan Test Result

140mm QFan & standard Fan comparison chart

The 140mm ball bearing **QFan** effectively decreases the noise level inside the PSU. Performance report as below:







Toughpower QFan 500W/650W

500W

W0151

650W

W0163

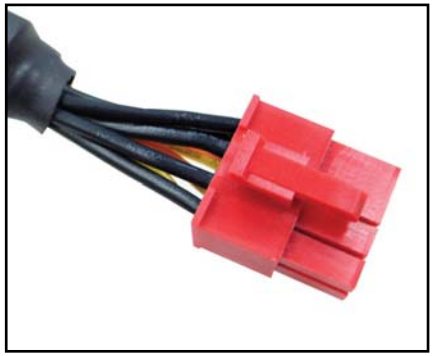
Toughpower QFan 500W/650W are designed to support all high-end NVIDIA & AMD graphic cards and processors applications. The Toughpower internal structure has been optimized to provide "Most quiet and reliable" performance. The main features of Toughpower QFan series are list as below:

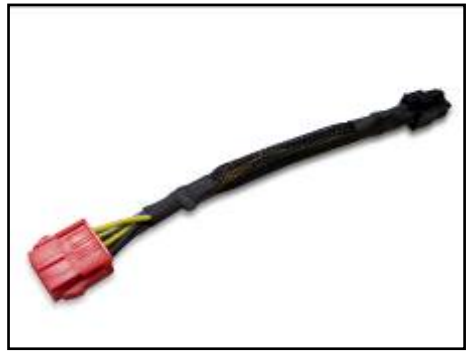
1. NEW!! 8 Pin PCI-Express Connector
2. Excellent Efficiency (up to 85%)
3. Extremely Good Voltage Regulation(±3%)
4. MTBF > 120,000 hrs
5. Independent +12V rails
6. Cable Management
7. Industrial grade components
8. Hi-Tech Black Coating
9. High +5VSB Output

Quick Overview 1

1. NEW ! ! 8 pin PCI-E Connector (650W Model)

Toughpower **QFan** 650W power supplies come with the latest 8-pin PCI-E connector required for the next generation NVIDIA and AMD high-end graphics cards. The 8-pin connector are compatible with the existing 6-pin PCI-E connector using a 8-pin to 6-pin adapter.





The Toughpower QFan 500W model supports two 6-pin PCI-Express connectors for current version of NVIDIA or AMD graphic cards only.

Quick Overview 2

2. Excellent Efficiency (up to 85%)
Toughpower **QFan** 500W/650w provide excellent efficiency and hence reducing energy consumption. That in return reduces customers' electricity bill.

3. Extremely Good Voltage Regulation (±3%)
This feature allows tighter load regulation (±3%) than other power supplies (±5%) and increase system voltage stability.

4. MTBF > 120,000 Hours (Highly reliable)
120,000 hours of MTBF (Mean Time between Failures) goes above and beyond all ATX specifications.

Quick Overview 3

5. Independent +12V rails

Toughpower **QFan** series supports up to **FOUR** independent & powerful +12V rails for high-end graphic cards and PC system.

Model	W0151	W0163
Power Watts	500W	650W
No. of +12V rails	3	4
Combined Load	36A	52A

Quick Overview 4

6.Cable Management

Cable Management enables users to remove unused cables and significantly improves the airflow in the chassis.

7.Industrial Grade Components (capacitor, transformer, etc)

All components are specially designed for industrial environment and extreme conditions.

8.Hi-Tech Black Coating

With special Hi-Tech Black coating, Toughpower **QFan** 500W/650W PSUs transmit professional, elegant and unique image.

9.High +5VSB Output

Built-in higher +5VSB (from 3A to 3.5A(Peak Current)) supports up to 12 USB devices. Also, even the system is power off, USB devices can still be charged by the 3A sustained output.

QFan Specification

<SPECIFICATION>		
P/N	**W0151**	**W0163**
Power	**500W**	**650W**
Color	Hi -Tech Black	
Switches	ATX Logic on-off additional power rocker switch	
PFC (Power Factor Correction)	Active PFC	
Cooling System	**140mm QFan, 1900RPM ± 10%**	
Noise	**17.1 dBA at 4.75V (20%~50% Load)**	
P. G. Signal	100-500 ms	
Over Voltage Protection **Recycle AC to Reset**	+5V trip point +7.0Vmax +3.3V trip point +4.5Vmax +12V trip point +15.6Vmax	
<DIMENSIONS>		
Unit Size	150mm(L)x160mm(W)x86mm(H)	
Net Weight	**2.02Kg**	**2.04Kg**
<INPUT>		
Input Voltage	115 VAC ~ 230 VAC	
Input Frequency Range	47 ~ 63 Hz	
Input Current	**6A/3A**	**8A/4A**
Hold-up Time	16ms at 80% of full load	
Efficiency	up to 85%	

QFan 500W Output Info.

- **QFan 500W P/N: W0151**

AC INPUT	115V/ 230V 6/3A 47~63Hz						
DC OUTPUT	+3.3V	+5V	+12V1	+12V2	+12V3	-12V	+5VSB
Output Current	30A	28A	18A	18A	16A	0.8A	3A
Min Current	0.5A	2.0A	1.0A	1.0A	1.0A	0.0A	0.0A
Peak Current	--	--	--	--	--	--	3.5A
Max Combined Wattage	99W	140W	432W			9.6W	15W

The continuous total output power is 500W, peak 600W(60 Sec).
The combined power of +5V & +3.3V is 140W max.
Total combined +12V output load not exceed 36A.

QFan 650W Output Info.

➢ **QFan 650W P/N: W0163**

AC INPUT	115V/ 230V 8/4A 47~63Hz							
DC OUTPUT	+3.3V	+5V	+12V1	+12V2	+12V3	+12V4	-12V	+5VSB
Max Output Current	30A	28A	18A	18A	18A	16A	0.8A	3A
Min Current	0.5A	2A	1.0A	1.0A	1.0A	1.0A	0.0A	0.0A
Peak Current	--	--	--	--	--	--	--	3.5A
Max Combined Wattage	99W	140W	624W				9.6W	15W

The continuous total output power is 650W, peak 750W(60 Sec).
The combined power of +5V & +3.3V is 180W max.
Total combined +12V output load not exceed 52A.

12V rail distribution

W0151 500W	
24 pin +12V	12V3
4 pin +12V	12V1
8 pin +12V	12V1
Peripheral & Floppy	12V3
S-ATA	12V3
6 pin Modular PCI-E	12V2
6 pin Modular PCI-E	12V2

W0163 650W	
24 pin +12V	12V3
4 pin +12V	12V1
8 pin +12V	12V1,12V2
Peripheral & Floppy	12V4
S-ATA	12V4
6 pin Modular PCI-E	12V2
6 pin Modular PCI-E	12V2
8 pin Native PCI-E	12V3

Product Appearance

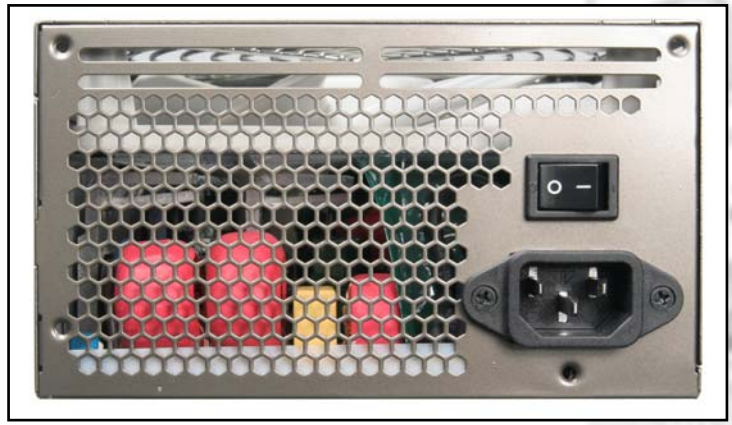
Toughpower QFan 500W P/N: W0151

Top View

Front View

Packaging

Side View



Back View

Product Appearance

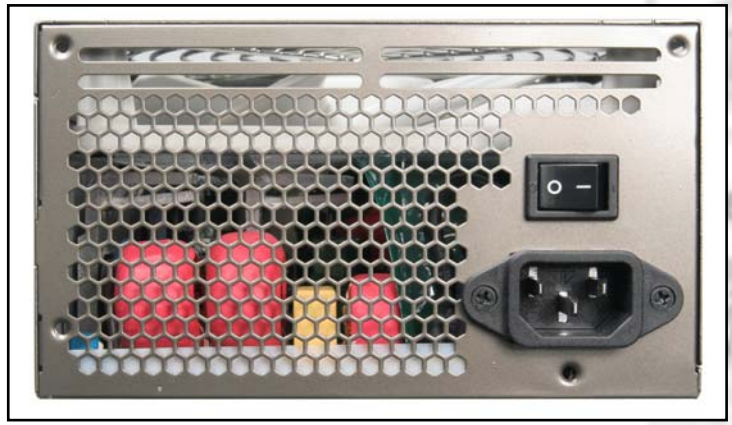
Toughpower QFan 650W P/N: W0163

Top View

Front View

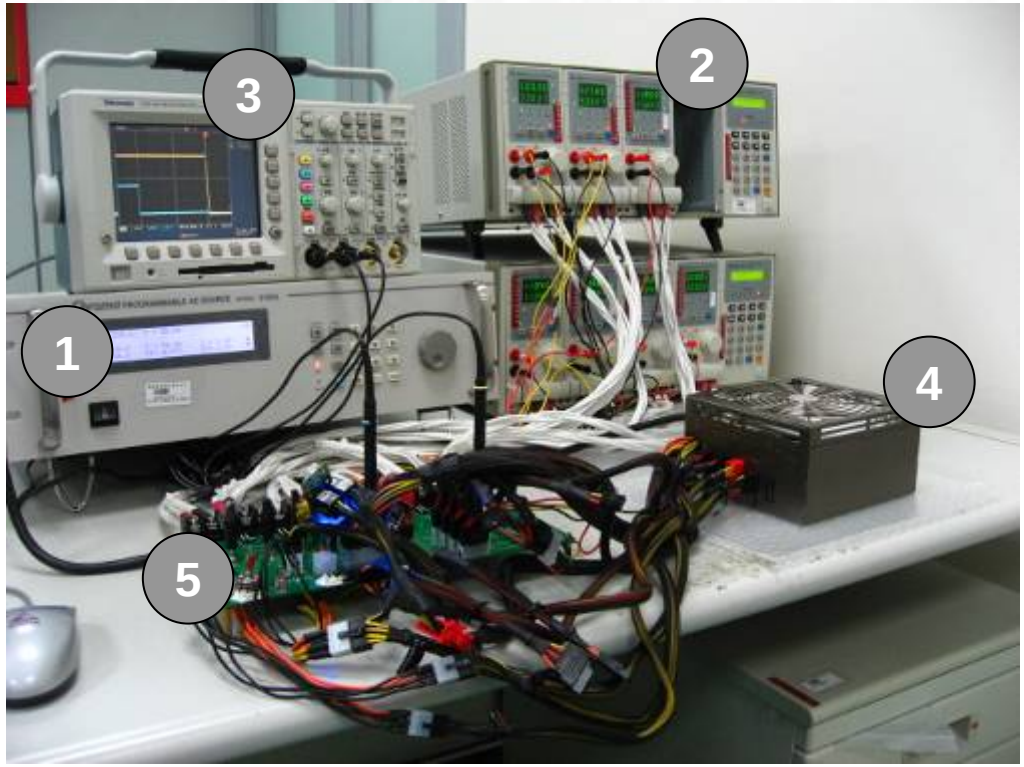
Packaging

Side View



Back View

PSU Electronic Test



1. Chroma 61604 Program Mable AC Source	4. Toughpower QFan PSU
2. Chroma 6314 DC Electronic Load Main Frame	5. Bridge PCB Board
3. Tektronix TDS3014B Digital Phosphor Oscilloscope t Test Fixture	

Output Test Result

Vin	Vout / Load	+5V (V)	+3.3V (V)	+12V1 (V)	+12V2 (V)	+12V3 (V)	+12V4 (V)	-12V (V)	+5Vsb (V)
104V/47HZ	Full Load	5.04	3.28	11.9	11.97	11.96	11.93	-12.2	5.03
	Normal Load	5.04	3.26	11.93	12	11.98	11.96	-12.29	5.07
	Min Load	5.08	3.35	12.02	12.03	12.02	12.02	-12.18	5.14
115V/60HZ	Full Load	5.03	3.27	11.9	11.97	11.95	11.93	-12.2	5.03
	Normal Load	5.04	3.26	11.93	12	11.99	11.96	-12.29	5.07
	Min Load	5.08	3.35	12.02	12.03	12.03	12.03	-12.18	5.14
180V/47HZ	Full Load	5.03	3.3	11.9	11.99	11.96	11.94	-12.18	5.03
	Normal Load	5.06	3.26	11.93	12	11.98	11.96	-12.29	5.07
	Min Load	5.08	3.35	12.03	12.03	12.03	12.03	-12.19	5.15
230V/50HZ	Full Load	5.03	3.31	11.9	11.97	11.96	11.93	-12.2	5.03
	Normal Load	5.05	3.29	11.96	12.01	12	11.98	-12.29	5.07
	Min Load	5.08	3.35	12.03	12.03	12.03	12.03	-12.19	5.15
254V/63HZ	Full Load	5.03	3.29	11.9	11.97	11.96	11.93	-12.21	5.03
	Normal Load	5.05	3.27	11.95	12	12	11.98	-12.29	5.08
	Min Load	5.08	3.35	12.03	12.04	12.03	12.03	-12.19	5.15
Spec		+3/-3%	+3/-3%	+3/-3%	+3/-3%	+3/-3%	+3/-3%	+9/-5%	+5/-3%

PASS